



# NASA Health and Medical Technical Authority



## Assuring Crew Health Protection

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# CAIB Report Recommendation

- The Health and Medical Technical Authority is the direct result of the CAIB
- CAIB Recommendation:
  - Establish an Independent Technical Authority, with responsibilities that include:
    - Develop and maintain technical standards
    - Sole waiver-granting authority for all technical standards
    - Conduct integrated hazard analyses
- Health and Medical Technical Authority is 1 of 3 in the agency.





# Health and Medical Authority Implementation at JSC

- Implementation at the Johnson Space Center by the Chief Medical Officer (JSC CMO)
  - Includes 6 Health and Medical Discipline Experts appointed by the JSC CMO, in the areas of crew health management, spacecraft and environment management, microgravity countermeasures, habitability, radiation and behavioral health and performance.
  - Independent of program direction
  - Reports to the NASA Chief Health and Medical Officer
- Accountability and responsibility:
  - Assure compliance with health & medical standards/technical requirements
  - Review appeals of standards and requirements that are not met in a specific program or project
  - Approve deviations to program and project health & medical standards/technical requirements, products, processes and policies at JSC

# Human System Standards: Managing Human Space Flight Risk

- Standards are used to manage the risks associated with Human Space Flight
- Standards define acceptable risk
  - Acceptable mission risk – program specific
  - Acceptable risks to long term astronaut health
    - Agency “Mission” Risk
- Standards implement health and medical policy
  - Establish standards to define an acceptable level of risk
  - Standards are evidence based
    - use best available information
    - evaluated against the space flight environment
  - Operational experience is assessed to inform the standards
  - Research projects are defined to fill the gaps in knowledge







# Application of Human System Standards

- NASA Standards manage risk to crew health within acceptable limits
  - Selection criteria
  - Health monitoring systems
  - Environmental monitoring systems
  - Countermeasure systems, e.g.,
    - Pharmaceuticals
    - Exercise systems
- NASA Human System Standards Include
  - Human Health and Performance Standards (permissible outcome or exposure limits, fitness for duty criteria, levels of medical care)
  - Habitability and Environmental Health Standards (design standards that address habitability, space human factors, environmental acceptable limits)
  - Crewmember Medical Standards
    - Volume 1 - selection and periodic certification
    - Volume 2 - Medical Evaluation
- Respond to medical events and emergencies consistent with acceptable levels defined by standards





# Making the Hard Decisions

- Highest priority concerns, including un-met standards or requirements, that pose a threat to crew health and safety are brought forward for review by owner.
  - **Reviewed by the JSC CMO & HMTA**
- JSC CMO recommends the need for a waiver to the NASA CHMO for consideration
  - **CHMO either approves waiver or recommends no waiver**
- NASA Administrator then considers CHMO opinion vs. opinion of the Mission Directorate AA (SOMD or ESMD)
- A decision to waive a standard or requirement sets a level of acceptable risk for the NASA; OR a decision is made to provide resources required to meet a standard/requirement.





# Providing Expertise for Program Milestones

- HMTA convened to review assessment of Crew Exploration Vehicle (Orion) project readiness to move into next phase of development
- Defined issues/open work and “watch” items that exist from HMTA perspective
- HMTA agreed to endorse the transition of Orion from SRR to SDR, with issues and watch items noted
- All Technical Authorities brief the JSC Integrated Center Management Council
  - Process “alerts” Center Director to Health and Medical issues
  - Forum to address expert concern
  - Health and Medical considerations have equal stature with Engineering and Safety.

